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EXAMINER	
SWERDLOW, DANIEL	

ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 06/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/614,535	SHAFFER ET AL.	
	Examiner	Art Unit	
	Daniel Swerdlow	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 July 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,9-11,14,15,17-21,25,30-33,36-41 and 43-65* is/are rejected.

7)☒ Claim(s) *6-8,12,13,16,22-24,26-29,34,35 and 42* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 July 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 10 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 10 and 11 recite the limitation "that sample block" in the last line. There is insufficient antecedent basis for this limitation in the claim. To advance prosecution to the maximum possible extent, for the purpose of this Office action, examiner assumes the recitation is intended as "that signal block".

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 2, 5, 14, 15, 17, 18, 21, 30 through 33, 37, 41, 45 through 51 and 54 through 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minami (US Patent 4,815,132) in view of Weinstein et al. (IEEE SAC-1 No. 6).

5. Regarding Claim 1, Minami discloses receiving a right channel voice signal and a left channel voice signal (i.e., concurrently captured first and second sound field signals) of a

speaker's voice (i.e., representing a single sound field) with right and left channel microphones (i.e., at two spatially separated points) (Fig. 4, reference 1R, 1L; column 4, lines 29-32; column 6, lines 16-18). Minami further discloses an analog to digital converter (Fig. 4, reference 26R; column 6, lines 19-22) that converts the right channel voice signal to a digital signal (i.e., digitally encodes a signal block to represent the sound field signals). Minami further discloses an approximator (Fig. 4, reference 30; column 6, lines 24-54) that approximates a transfer function between the right channel voice signal and the left channel voice signal (i.e., estimates relative temporal delay between first and second sound field signals). Minami further discloses a transmitter (Fig. 4, reference 35; column 7, lines 24-30) that transmits the right channel voice signal (i.e., the encoded signal block) and transfer function information (i.e., stereo decoding parameter) to a receiving end (i.e., remote conferencing point). Therefore, Minami anticipates all elements of Claim 1 except transmission in packet format. Weinstein teaches that packet networks offer significant benefits for voice communication including cost and channel capacity savings (p. 963, column 2). As such, it would have been obvious to one skilled in the art at the time of the invention to apply packet transmission as taught by Weinstein to the system taught by Minami for the purpose of realizing the aforesaid advantages.

6. Regarding Claim 2, Minami further discloses transmitting the right channel voice signal and not the left channel voice signal (i.e., selecting one sound field signal as the source of the composite sound field signal and discarding the other sound field signal) (column 7, lines 24-37).

7. Regarding Claim 5, Minami further discloses the main data voice signal synchronized with the additional data (i.e., the relative temporal delay estimated using substantially only sound field signals captured during the same time period) (column 7, lines 7-12).

8. Regarding Claim 14, Minami further discloses transmitting a transfer function defining the relationship between the right channel voice signal and the left channel voice signal (column 4, line 39) that inherently includes relative amplitude (i.e., a stereo balance parameter).

9. Regarding Claim 15, Minami further discloses transmitting a transfer function defining the relationship between the right channel voice signal and the left channel voice signal as a function of frequency (column 4, line 39) that inherently includes estimating signal energy in subbands.

10. Claims 17, 18, 30 and 31 are essentially similar to Claims 1, 2, 14 and 15, respectively, and are rejected on the same grounds.

11. Claim 21 is essentially similar to Claim 5 and is rejected on the same grounds.

12. Claims 32 and 37 are essentially similar to Claim 1 and is rejected on the same grounds.

13. Regarding Claim 33, Minami further discloses right and left analog to digital converters (Fig. 4, reference 26R, 26L; column 6, lines 19-22) that converts the right and left channel voice signal to digital signals, which inherently includes buffering.

14. Claim 41 is essentially similar to Claim 33 and is rejected on the same grounds.

15. Claim 45 is essentially similar to Claim 14 and is rejected on the same grounds.

16. Regarding Claim 46, Minami further discloses transmitting a transfer function defining the relationship between the right channel voice signal and the left channel voice signal as a function of frequency (column 4, line 39) that inherently includes estimating signal energy in subbands and inherently includes relative amplitude (i.e., a stereo balance parameter).

17. Regarding Claim 47, Minami discloses a separator (i.e., parser) (Fig. 4, reference 36; column 7, lines 35-37) that separates the right channel voice signal (i.e., encoded signal block)

and the additional data (i.e., stereo decoding parameter). Minami further discloses an ADPCM circuit (i.e., decoder) (Fig. 4, reference 37; column 7, lines 34-35) that decodes the right channel voice signal (i.e., receives and decodes signal blocks) to produce a decoded signal (i.e., voice sample stream). Minami further discloses the filter (i.e., splitter) (Fig. 4, reference 41; column 7, lines 41-43) that is coupled to the right channel voice signal (i.e., voice sample stream) and uses the tap coefficients (i.e., stereo decoding parameter) to produce the left channel voice signal (i.e., create multiple output signal channels based on the voice sample stream). Therefore, Minami anticipates all elements of Claim 47 except transmission in packet format. Weinstein teaches that packet networks offer significant benefits for voice communication including cost and channel capacity savings (p. 963, column 2). As such, it would have been obvious to one skilled in the art at the time of the invention to apply packet transmission as taught by Weinstein to the system taught by Minami for the purpose of realizing the aforesaid advantages.

18. Regarding Claim 48, Weinstein further discloses buffering to smooth variable packet delays (i.e., jitter buffer) (page 966, column 1). It would have been obvious to one skilled in the art at the time of the invention to apply a jitter buffer as taught by Weinstein to the combination made obvious by Minami and Weinstein for the purpose of playing out received packets at the correct time.

19. Regarding Claim 49, Minami further discloses approximating a transfer function between the right channel voice signal and the left channel voice signal (i.e., a delay parameter between first and second sound field signals) (column 6, lines 24-54) and a filter (i.e., playout splitter) (Fig. 4, reference 41; column 7, lines 41-43) that is coupled to the right channel voice signal (i.e.,

voice sample stream) and uses the tap coefficients (i.e., stereo decoding parameter) to produce a delay in the left channel voice signal.

20. Regarding Claim 50, Minami further discloses transmitting a transfer function defining the relationship between the right channel voice signal and the left channel voice signal (column 4, line 39) that inherently includes relative amplitude (i.e., a stereo balance parameter).

21. Regarding Claim 51, Minami further discloses transmitting a transfer function defining the relationship between the right channel voice signal and the left channel voice signal as a function of frequency (i.e., playout amplitude modification is audio frequency dependent) (column 4, line 39).

22. Claims 54, 58 and 62 are essentially similar to Claim 47 and are rejected on the same grounds.

23. Claims 55, 59 and 63 are essentially similar to Claim 49 and are rejected on the same grounds.

24. Claim 56, 60 and 64 are essentially similar to Claim 50 and are rejected on the same grounds.

25. Regarding Claim 57, Minami further discloses representation of transmission direction (i.e., arrival angle parameter) (column 3, lines 36-38) and splitting the right channel voice signal with an adaptive filter (Fig. 4, reference 41; column 7, lines 41-43) to create the perception of an audio signal from that direction.

26. Claims 61 and 65 are essentially similar to Claim 57 and are rejected on the same grounds.

27. Claims 3, 4, 9, 19, 20, 25, 36, 38 through 40, 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minami in view of Weinstein and further in view of Coker et al. (US Patent 4,581,758).

28. Regarding Claim 3, as shown above apropos of Claim 1, the combination of Minami and Weinstein makes obvious all elements except calculating a first-to-second sound field cross correlation for each of a plurality of time shifts and selecting a temporal delay corresponding to the time shift generating the largest cross correlation. Coker discloses sound source location by cross correlating two microphone inputs over a series of time intervals (i.e., a plurality of time shifts) (column 2, lines 36-43) and selecting the delay with the greatest correlation (column 9, lines 60-64). It would have been obvious to one skilled in the art at the time of the invention to apply the cross correlation method of determining time delay as taught by Coker to the combination made obvious by Minami and Weinstein for the purpose of locating the sound source in a noisy reverberant environment (Coker: column 2, lines 18-22).

29. Regarding Claim 4, Coker further teaches deriving delay from energy burst pulses in response to speech sounds (i.e., limiting variation of estimated delay during a talkspurt) (column 3, line 66 through column 4, line10).

30. Regarding Claim 9, as shown above apropos of Claim 1, the combination of Minami and Weinstein makes obvious all elements except the stereo decoding parameter expressing an estimated angle of arrival based on relative delay and positioning of the spatially separated points. Coker discloses sound source location by determining angle from which sound is coming (i.e., angle of arrival) (column 9, lines 60-64) and relative microphone position (i.e., positioning of the spatially separated points) (column 2, lines 25-28). It would have been obvious to one

skilled in the art at the time of the invention to apply the angle determination as taught by Coker to the combination made obvious by Minami and Weinstein for the purpose of locating the sound source in a noisy reverberant environment (Coker: column 2, lines 18-22).

31. Claims 19, 36 and 43 are essentially similar to Claim 3 and are rejected on the same grounds.

32. Claims 20 and 38 are essentially similar to Claim 4 and are rejected on the same grounds.

33. Claims 25 and 44 are essentially similar to Claim 9 and are rejected on the same grounds.

34. Regarding Claim 39, Coker further discloses event (i.e., voice activity) detectors (Fig. 1, reference 401, 402; column 3, line 66 through column 4, line 1) that enable a direction identification process (Fig. 9, loop A; column 9, line 6-9).

35. Regarding Claim 40, Coker further discloses an event detector for each audio channel (Fig. 1, reference 401, 402; column 3, line 66 through column 4, line 1) and direction identification based on time delay between corresponding signals (column 4, lines 7-11).

36. Claims 52 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minami in view of Weinstein and further in view of McClennon et al. (US Patent 6,408,327).

37. Regarding Claim 52, as shown above apropos of Claim 47, the combination of Minami and Weinstein makes obvious all elements except a mixer to mix output signal channels with other signal channels derived from voice packets received from another remote conferencing point. McClennon discloses a conferencing system mixer (Fig. 3, reference 346; column 8, lines 10-13) that mixes signals received from a plurality of clients (i.e., output signal channels with other signal channels derived from voice packets received from another remote conferencing

point). McClennon teaches that multi-party teleconferencing is a popular application (column 1, lines 13-17). It would have been obvious to one skilled in the art at the time of the invention to apply signal mixing as taught by Coker to the combination made obvious by Minami and Weinstein for the purpose of providing a multi-party teleconference.

38. Regarding Claim 53, McClennon further discloses transmission of the mixed signal over a LAN/WAN to other clients (i.e., placing the mixer output into packet format for transmission to a remote conferencing endpoint) (column 8, lines 19-22).

Allowable Subject Matter

39. Claims 6 through 8, 10 through 13, 16, 22 through 24, 26 through 29, 34, 35, 39, 40 and 42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In addition, as stated above under *Claim Rejections 35 USC 112*, Claims 10 and 11 require proper antecedent basis.

40. Regarding Claim 6, as shown above apropos of Claim 1, the combination of Minami and Weinstein makes obvious all elements except estimating temporal delay using substantially all sound field signals corresponding to the current talkspurt up to and including at least a first portion of the time period. Minami discloses updating the additional data that corresponds to the delay parameter claimed upon the error signal surpassing a threshold (Fig. 6). As such, the delay estimate does not generally correspond to all sound field signals in a current talkspurt. Therefore, Claim 6 is allowable matter.

41. Claim 22 is essentially similar to Claim 6 and is allowable matter for the same reasons.

42. Regarding Claim 7, as shown above apropos of Claim 1, the combination of Minami and Weinstein makes obvious all elements except estimating temporal delay using relative beginnings of a talkspurt. Minami discloses determining transfer function using an adaptive filter. Coker discloses determining delay using cross correlation. As such, the prior art neither anticipates nor makes obvious estimating temporal delay using relative beginnings of a talkspurt. Therefore, Claim 7 is allowable matter.

43. Claim 23 is essentially similar to Claim 7 and is allowable matter for the same reasons.

44. Regarding Claim 8, as shown above apropos of Claim 1, the combination of Minami and Weinstein makes obvious all elements except expressing temporal delay as an integer number of digital sampling intervals. Minami discloses expressing temporal delay as a transfer function using an adaptive filter. Coker discloses expressing temporal delay as a number of 100kHz clock pulses (column 7, lines 53-58). As such, the prior art neither anticipates nor makes obvious expressing temporal delay as an integer number of digital sampling intervals. Therefore, Claim 8 is allowable matter.

45. Claim 24 is essentially similar to Claim 8 and is allowable matter for the same reasons.

46. Regarding Claims 10 through 12, 16 and 26 through 28, while the prior art makes obvious the combination of the system taught by Minami and a packet network as taught by Weinstein, there is no suggestion or teaching for the particular formats claimed.

47. Regarding Claim 13, as shown above apropos of Claim 1, the combination of Minami and Weinstein makes obvious all elements except the stereo decoding parameter being transmitted once per talkspurt. Minami discloses updating the additional data that corresponds to the stereo decoding parameter claimed upon the error signal surpassing a threshold (Fig. 6). As

such, the parameter is not generally transmitted once per talkspurt. Therefore, Claim 13 is allowable matter.

48. Claim 29 is essentially similar to Claim 13 and is allowable matter for the same reasons.

49. Regarding Claim 34, as shown above apropos of Claim 1, the combination of Minami and Weinstein makes obvious all elements except receiving concurrently captured first and second sound field signals comprising receiving digital voice samples from a remote conferencing endpoint. Minami discloses receiving a right channel voice signal and a left channel voice signal (i.e., concurrently captured first and second sound field signals) of a speaker's voice (i.e., representing a single sound field) with right and left channel microphones (Fig. 4, reference 1R, 1L; column 4, lines 29-32; column 6, lines 16-18) collocated with other elements. Therefore, the prior fails to anticipate or make obvious receiving the sound field signals from a remote location before encoding. As such, Claim 34 is allowable matter.

50. Regarding Claim 35, Minami further discloses an ADPCM circuit (i.e., encoder) (Fig. 4, reference 34; column 7, lines 24-30) that encodes the voice signal. Therefore, the combination of Minami and Weinstein makes obvious all elements except an adder to create a combined sound field signal. Minami discloses transmitting only the right channel voice signal and additional data. Therefore, the prior fails to anticipate or make obvious an adder to create a combined sound field signal. As such, Claim 35 is allowable matter.

51. Claim 42 is essentially similar to Claim 35 and is allowable matter for the same reasons.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Swerdlow whose telephone number is 703-305-4088. The examiner can normally be reached on Monday through Friday between 8:00 AM and 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forrester Isen can be reached on 703-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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